

CLAIMS

What is claimed is:

1. An apparatus comprising:
 - 5 at least two dice;
 each of said dice having at least one electrical connection disposed on a
 single surface;
 said dice electrically coupled with at least one connector between said
 electrical connections that are oriented in the same direction when said dice are
10 stacked and offset.
2. The apparatus of claim 1 wherein said dice are identical.
3. The apparatus of claim 1 wherein said at least one electrical connection is
15 disposed on only one surface.
4. The apparatus of claim 1 wherein said dice are aligned.
5. The apparatus of claim 1 wherein said dice are attached.
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6. The apparatus of claim 5 wherein said dice are attached with adhesive.
7. The apparatus of claim 1 wherein said dice are memory.
- 25 8. The apparatus of claim 1 wherein said dice are synchronous dynamic random
 access memory.
9. The apparatus of claim 7 wherein said synchronous dynamic random access
30 memory is electrically coupled to a die having channel and controller
 functions.

10. The apparatus of claim 8 wherein said synchronous dynamic random access memory is packaged in a single package with said die having channel and controller functions.
- 5 11. The apparatus of claim 1 wherein said electrical connections from one die to another are made through intermediate electrical connections external from said dice.
12. The apparatus of claim 1 wherein said electrical connections are disposed on
10 one edge.
13. The apparatus of claim 1 wherein said apparatus comprises a storage device.
14. An apparatus comprising:
15 at least two dice;
each of said dice having a plurality of electrical connections disposed on only one surface;
said dice stacked and offset with said electrical connections oriented in the same direction;
20 said dice are electrically coupled with at least one electrical connector.
15. The apparatus of claim 14 wherein said dice are identical.
16. The apparatus of claim 14 wherein said dice are aligned.
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17. The apparatus of claim 14 wherein said dice are attached.
18. The apparatus of claim 17 wherein said dice are attached with adhesive.
- 30 19. The apparatus of claim 14 wherein said electrical connections are disposed on one edge.
20. The apparatus of claim 14 wherein said dice are memory.

21. The apparatus of claim 14 wherein said dice are synchronous dynamic random access memory.
- 5 22. The apparatus of claim 21 wherein said synchronous dynamic random access memory is electrically coupled to a die having channel and controller functions.
23. The apparatus of claim 21 wherein said synchronous dynamic random access
10 memory is packaged in a single package with said die having channel and controller functions.
24. The apparatus of claim 14 wherein said electrical connections from one die to another are made through intermediate electrical connections external from
15 said dice.
25. A method comprising:
- placing a first die having electrical connections disposed on one surface in a first area of a package;
- 20 applying an adhesive layer on said first die;
- aligning a second die having electrical connections disposed on one surface;
- orienting said electrical connections on said first die and on said second die in a same direction;
- 25 offsetting said second die relative to said first die;
- placing said second die on said adhesive layer;
- electrically coupling said electrical connections that are oriented in said same direction on said first die and said second die.
- 30 26. The method of claim 25 further comprising electrically connecting said first die and said second die to a third die wherein said third die includes a controller function and a channel function for a disc drive.

27. The method of claim 25 further comprising packaging said first die and said second die in a single package.

28. The method of claim 25 further comprising packaging said first die, said
5 second die and said third die in a single package.